

# RICHARD CALARCO

- Certified Sports Field Manager
- Certified Parks and Recreation Professional
- Supervisory Pesticide Applicator
- Accredited Organic Land Care Professional

## **EDUCATION**

- *Green School Turf Management* **Umass**
- *Bachelor Science Personnel & Industrial Relations, **Syracuse University, Syracuse New York***
- *Master Science Recreation Education, **Syracuse University, Syracuse New York***

## **PROFESSIONAL AFFILIATION**

- President Connecticut Park Association
- Vice President New England Sports Turf
- Member National Sports Turf Manager's Environmental Committee
- Member UConn IPM Committee

## **PROFESSIONAL EXPERIENCE**

- **2004-Present** *Town of Hebron CT*
- **2002 –2004** *City of Torrington, CT*
- **2001 – 2002** *New England Sportsplex, CT*
- **1979 – 2001** *Town of Killingly, CT*

# BEST MANAGEMENT PRACTICES USING INTEGRATED PEST MANAGEMENT

The Parks Department uses an integrated pest management plan. This plan entails using common sense and good cultural practices in the maintenance of turf.

## Keys to Success

- Maintain the site history
- Identification of the source of any problems
- If problem-what is the cause (i.e., disease, insect, weed)
- Determination of the tolerance level for pest
- Regular Scouting
- Determination other means available then pesticides
- Identification and implementation of cultural techniques to manage pest problems



# BEST MANAGEMENT PRACTICES USING INTEGRATED PEST MANAGEMENT

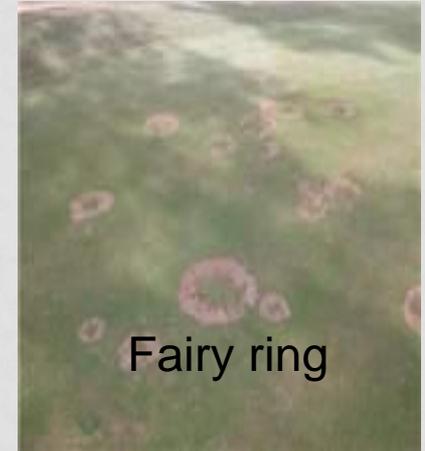
**Ornamental & Turf Program** is needed for the purpose of identifying areas of pest infestation (weed, insect & disease) on grounds.



White clover



Cinch bugs



Fairy ring



The Supervisor shall review areas that have been problematic or sensitive (e.g., wet, shady and/or high traffic areas or areas where there is a history of high pest presence).

Once these areas have been identified, the supervisor will review various pest control options and determine the speed of control necessary as well as threshold/action levels based on pest population, species, plant health and aesthetic considerations.

# OBJECTIVES

The purpose of identifying areas of pest infestation (weed, insect & disease) on the grounds of the facility, making recommendations for corrective measures that should be implemented and developing a comprehensive integrated pest management (“IPM”) plan. The IPM plan will utilize all methods of pest control which may include modifying cultural practices, monitoring for pest populations, mechanical and biological control and the judicious use of pesticides. biological controls such as predatory insects, beneficial nematodes or microbial pesticides will be used. As well as plant and grass selection.



## Implementation

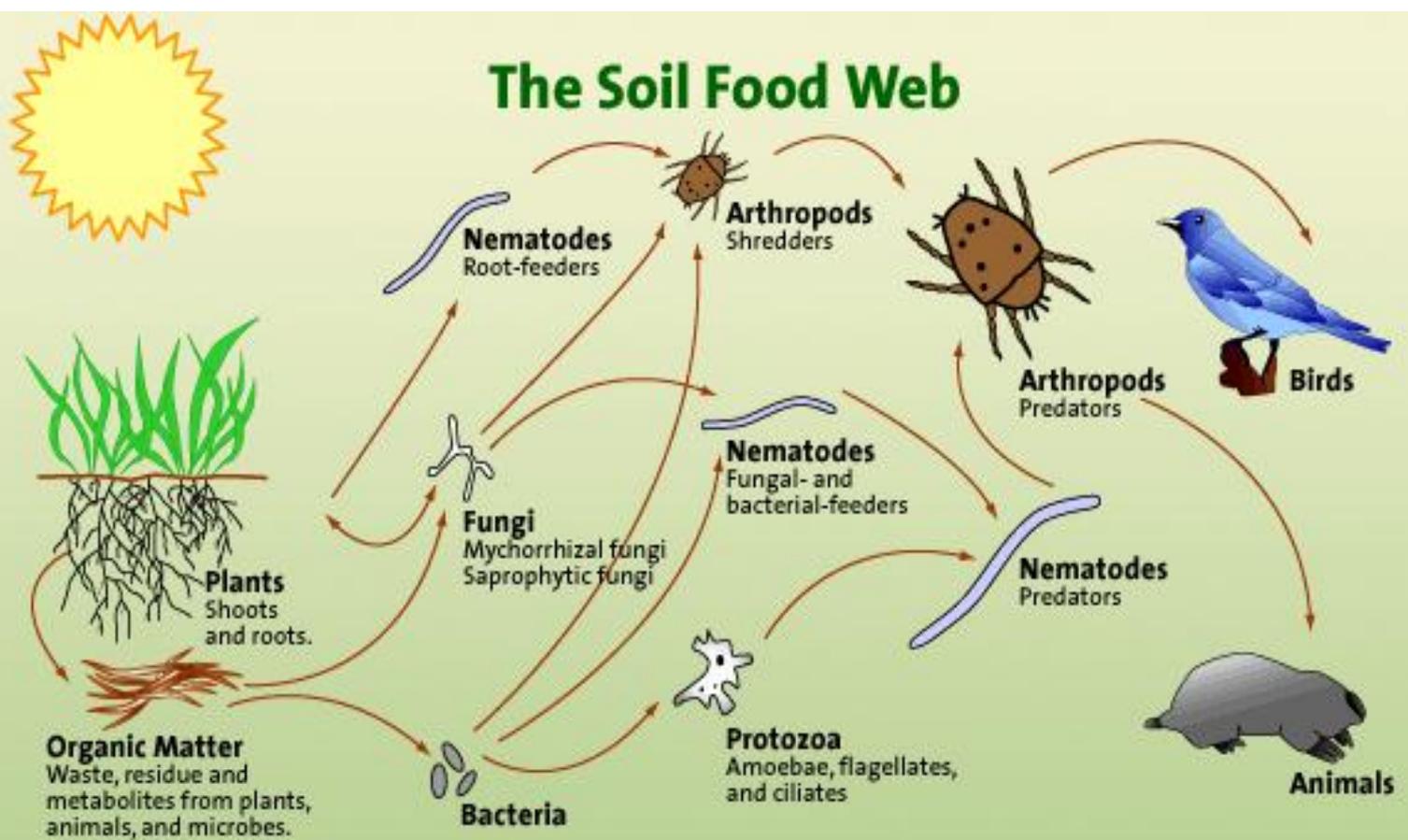
- Upon implementation of the IPM program and prior to the application of any fertilizer, soil samples will be collected by the Director and analyzed. Soil samples will also be collected and analyzed annually to assess soil fertility and ph.
- Proper management of grass clippings is an important part of maintaining the lawn. Grass clippings will remain on the lawn and allowed to degrade, returning 50% of available nitrogen back to the lawn or about 1 pound. This will help to increase the soil organic matter and promote beneficial earthworm activity.
- When practicable, organic fertilizers may be used, otherwise, fertilizer with 50% slow release nitrogen shall be utilized. Fertilizer should be applied no later than October 15th. Late fall applications of lime will be avoided if possible to reduce the risk of snow mold. Over-fertilization may result in an increase of some plant diseases, more frequent mowing, increased thatch layer and risk of leachate into groundwater in some circumstances.



# Irrigation

- Irrigation is absolutely essential for maintaining acceptable playing surface quality on natural turf grass
- athletic fields. *In the absence of irrigation, the expectations for playing surface quality should be dramatically reduced.*
- Adequate moisture is necessary to initiate/complete the germination process, and encourage seedling development.
- Irrigation is also imperative for the success  
and ease of completing other cultural practices such as  
fertilization, cultivation, and pest control.

# The Soil Food Web



**First trophic level:**  
Photosynthesizers

**Second trophic level:**  
Decomposing Mutualists  
Pathogens, Parasites  
Root-feeders

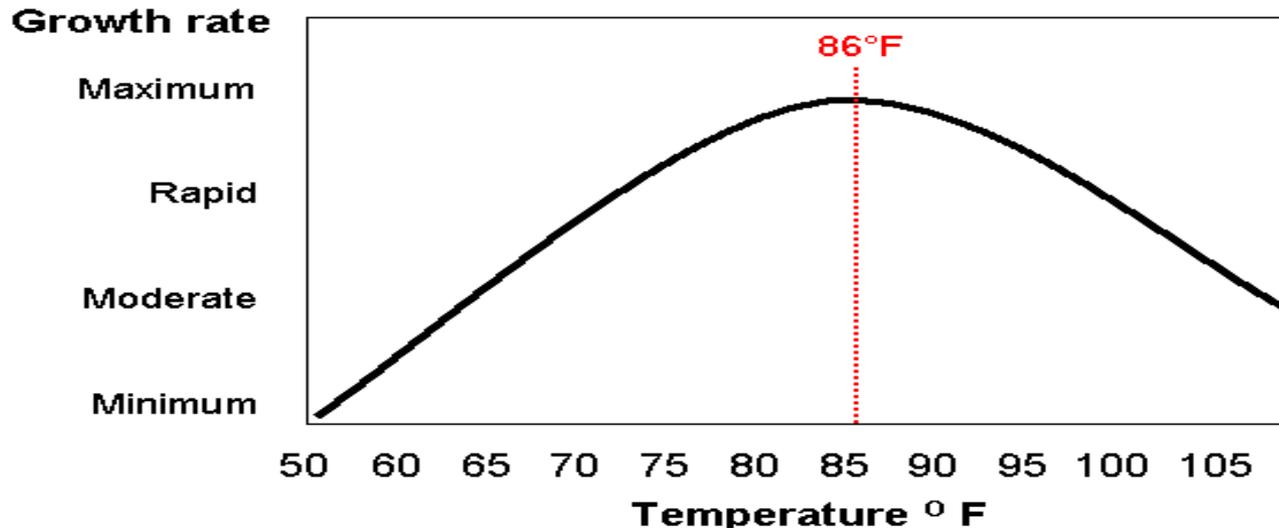
**Third trophic level:**  
Shredders  
Predators  
Grazers

**Fourth trophic level:**  
Higher level predators

**Fifth & higher trophic level:**  
Higher level predators

# GROWING DEGREE-DAY

- The growth rate of many biological organisms is controlled primarily by temperature. Figure 1 demonstrates a generalized response of growth rate to increasing temperature. Growth begins at some minimum (in this case 50°F). The rate of development increases with rising temperature until it reaches a plateau at some optimum temperature (86°F in the figure). As temperature increases above the optimum the growth rate declines. The shape of this response curve is similar among many organisms; however, the minimum, optimum, and maximum temperature will vary.



# SOIL TEMPERATURES



Soil temperature can serve as a useful guide for timing spring seeding operations. If the soil is too cool, germination is delayed, which results in seed damage and uneven or inadequate seeding emergence. It may even be necessary to reseed.

Temperature affects soil life in several ways. Organisms exhibit preferences for certain temperature ranges; the so-called minimum, maximum and optimum temperatures

# SOIL AND TISSUE TESTING

- **Soil tests should be conducted on a routine basis – every one (sand-based fields) to three (native soil fields) years is recommended.** A soil test will analyze nutrient requirements, pH, phosphorus and potassium levels, and will provide the best guide to fertilization to maintain or achieve a healthy field.
- **Tissue tests are a great diagnostic tool in that they provide a snapshot of nutrients present in the plant at the time the sample was taken.** However, their real value is realized if conducted simultaneously with a soil test since only the soil report can provide clues as to why a nutrient deficiency or toxicity is occurring



## TURF PLAN

Best management practices will be implemented at all times in an effort to maintain turf health and appearance. Turf will be mowed to 2 1/2" height or as high as possible on a weekly basis. Mowing should be done when the grass is dry to avoid spread of turf diseases. Mower blades should be maintained with sharp cutting edges to avoid excessive wounding and stress of the turf grass.

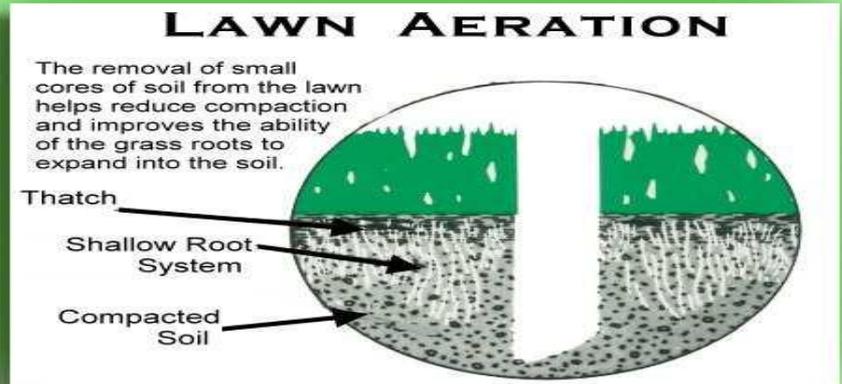
Over seeding the area in late summer/early fall with improved turf grass and raising the mower height during the growing season will help to prevent crabgrass encroachment.



# CULTIVATION

## ▣ Benefits of Soil Cultivation

- ▣ • Physical penetration of the soil improves air, water and nutrient movement within the root zone.
- ▣ • Corrects or alleviates soil compaction. This is especially important for high traffic areas such as goal mouths. It may be necessary to cultivate these areas 6-8 times per year.
- ▣ • Improve water infiltration.
- ▣ • Improve gaseous exchange between the soil and atmosphere.
- ▣ • Reduces thatch.



# INSECT CONTROL STRATEGIES FOR TURF

## BIOLOGICAL CONTROL

Predators, parasites, and pathogens that attack pest species. Predators include other insects and sometimes vertebrates

Advantages of natural controls include their safety, relative permanence, and relative economy, although all of these don't apply in all cases



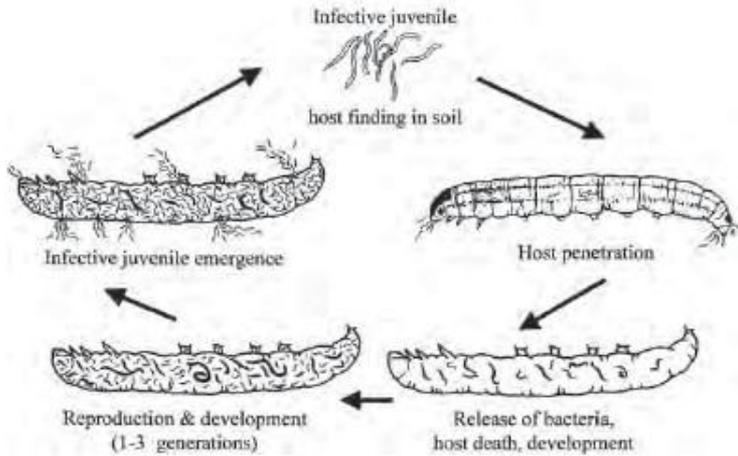
## TURF INSECTS

Visual inspection of the turf areas will be done monthly, April through September, by the certified supervisor to monitor for evidence of chinch bug, sod webworm, billbug and/or other destructive turf pests. Additional sampling may be performed to confirm the presence of these pests and/or White Grubs.

Applications of insecticide to turf areas will be limited in an effort to preserve populations of beneficial insects and nematodes.

1. White Grubs: 8-10 larvae/square foot
2. Chinch Bug: 30-50 Nymphs & adults/square foot or when damage is evident
3. Sod Webworms/Cutworms: Areas will be treated only when damage is evident
4. Hyperodes weevil (annual bluegrass weevil): tolerance
5. Black turf grass ataenius: tolerance
6. Ticks: tolerance





# Products not allowed

## FIESTA TURF WEED KILLER

Active Ingredient:

Iron HEDTA (FeHEDTA) ..... 26.52%

Other Ingredients: ..... 73.48%

**Total: ..... 100.00%**

**NOT FOR USE IN CALIFORNIA**

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

**FIRST AID**

IF IN EYES - Hold eye open and rinse slowly and gently with water for 15-20 minutes.

- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.

- Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Causes slight eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum or using tobacco.

**Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.**

**EPA Reg. No. – 67702-26-87865**

EPA Establishment No. – 58996-MO-1



# INVASIVE SPECIES

- Over the years, a variety of non-native species (plants, animals, and other organisms) have been introduced to Connecticut. Non-native species are those that are alien to the ecosystem that they have been introduced into and whose introduction causes or is likely to cause harm to the environment or human health. Some non-native species exhibit an aggressive growth habit and can out-compete and displace native species. These are referred to as invasive species and they are a serious problem in Connecticut and elsewhere.
- Protecting native species and the habitats in which they occur is an objective of Towns. To address the issue, Towns must take measures to control and remove invasive species on their land

## Invasive Insects

- [Emerald Ash Borer](#) (EAB)
- [Asian Long horned Beetle](#) (ALB)

**Oriental or Asiatic Bittersweet (*Celastrus orbiculatus*) is a highly invasive, non-native vine that grows vigorously, damaging trees and other plants and forming dense stands. Bittersweet produces an abundance of bright fruits, which are spread by birds and other animals to new locations.**

Result of child who went into woods around school woods to get a soccer ball



## School fields



## Town parks



Injuries??---Concussions





**Supervisor Field Condition Assessment Tool**

Date: \_\_\_\_\_

Evaluator: \_\_\_\_\_

**Turf Checklist**

Field Name/Location/Sport(s) \_\_\_\_\_

Comments: \_\_\_\_\_

<b>Turfgrass Species Present</b> (% of each)	Kentucky Bluegrass _____ Tall Fescue _____ Perennial Ryegrass _____ Fine Leaf Fescue _____ Other: _____	<u>Comment</u>
<b>Field Establishment</b>	Age: _____ Seed: _____ Sod: _____ Sun: _____ Shade: _____ %Shade: _____	
<b>Renovation History</b>	% Renovated _____ Date of Renovation _____ Type of Renovation _____	
<b>Thatch Accumulation</b>	_____ <1/2" _____ 1/2 to 1" _____ >1"	
<b>Color (5-1)</b>	Dark Green (5) Med. Green(4) Med./Light Green (3) Light Green (2) Yellow Green (1) Turf Dormant (TD)	
<b>Soil</b>	Texture: _____ Depth: _____ Condition: _____	

**Quality Checklist**

<b>Turf Rating Codes</b>	<p><b>Percent turf cover (turf density)</b> _____</p> <p>1&lt;10%                      6=51-60% 2=11-20%                7=61-70% 3=21-30%                8=71-80% 4=31-40%                9=81-90% 5=41-50%                10=&gt;90%</p> <p><b>Smoothness</b> _____</p> <p>5=smooth surface with no irregularities 4=smooth surface with some irregularities 3=surface is very uneven with irregularities that will moderately affect play 2=surface is very uneven with irregularities and vegetative clumps that will greatly affect play 1=surface is extremely uneven with holes and vegetative clumps that will greatly affect play and are hazardous</p>	<p><b>Turf Rating #</b> (% turf cover + smoothness rating) = _____</p>
<b>Surface Rating Code</b>	<p><b>Stones at the Surface</b> _____ <b>Percent Weeds</b> _____ <b>Depressions</b> _____</p> <p>0=none                      0&lt;10                      0=none 1=few                        1=11-20%                1=few 2=many                      2= 21-30%                2=moderate    3=31-40%                3=many    4&gt;40%                    4=extreme</p>	<p><b>Surface Rating #</b> (Stones + Weeds + Depressions) = _____</p>
<b>Overall Rating Code</b>	<p>Overall condition = (Percent cover + smoothness) – (Depressions + Stones + Percent Weeds)</p> <p>Excellent 15-12 Good 11-8 Fair 7-4 Poor 3-1 Unusable &lt;1</p>	<p><b>Overall Rating Code</b> (Turf rating # - Surface Rating #)</p>
<b>Field Use</b>	<p>Wear Damage: Heavy, _____ Moderate _____ Slight _____</p> <p>Traffic events/Week _____</p> <p>   ≥6 games                      5-3 games                      2≥ games</p> <p>Multiple Sports Usage: N _____ Y _____ Sports played _____</p>	



# COST COMPARISON OF SCHOOL GROUNDS VS TOWN PARKS

Hebron elementary				
	Labor Cost	11,286.00	Supplies Cost	6,024.70
	\$			
	22.00			
	Program Cost labor	Field Size	Cost Per Sq. Ft.	
	\$11,286.00	82,000	\$ 0.14	
	Program Cost materials	Field Size	Cost Per Sq. Ft.	
	\$ 6,024.70	82,000	\$ 0.07	
	Program Cost total	Field Size	Cost Per Sq. Ft.	
	\$17,310.70	82,000	\$ 0.21	

	town park		
Burnt hi multi	-		
1			
	Labor Cost	5,038.00	Supplies Cost 5,174.92
	\$		
	22.00	Labor Cost Per Hour	
	Program Cost labor	Field Size	Cost Per Sq. Ft.
	\$ 5,038.00	70,000	\$ 0.07
	Program Cost materials	Field Size	Cost Per Sq. Ft.
	\$ 5,174.92	70,000	\$ 0.07
	Program Cost total	Field Size	Cost Per Sq. Ft.
	\$ 10,212.92	70,000	\$ 0.15

# Summary

- ▣ School Grounds require The supervisor to submit the school superintendent an IPM plan for both schools.
- ▣ Pesticides with EPA numbers will not be used; only pesticides for turf/ornamental shall be 25B exempt. However, pesticides will be used to eliminate human threats as per state guidelines



- ▣ Best management practices will be implemented at all times in an effort to maintain turf and ornamental health.

# REMEMBER THIS

TURF GROWS BY THE INCH



But is Killed by the



foot

